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EXAMINER	
SARWAR, BABAR	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/580,165	LI ET AL.	
	Examiner	Art Unit	
	BABAR SARWAR	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 July 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed **07/08/2009** have been fully considered but they are not persuasive.

2. **Claims 1, 7** have been amended.

3. **Claims 1-26** are currently pending.

Applicant argued about various features wherein the device for realizing beam-forming in CDMA system comprises a beam-forming network which uses an analog fixed beam-forming technique; also comprises a base band system; and a reception filter at a radio frequency front end; a method for realizing beam-forming; when transmitting forward signals, different beams are made to have different time delays in the base band system so that they are not coherent with one another even when different beams carry same information; and making the base band signals of the fixed beams reflected to corresponding sectors of the base band chips have different time delays, read upon Hopp in view of Frank as follows;

Hopp discloses **element 22** in **Fig. 4** cited as being the network, since it is clear that there is a bus, a multiplexer, a demultiplexer, and a beam forming DSP, thus a beam forming network does exist. Hopp further discloses in **Para 0024** that the base station control unit transmits and receives signals from each planar antenna array in a digital base band system. Moreover, Hopp discloses filters in **Fig. 4 elements 70 and 80**.

Frank discloses a beam steering or beam forming technique as exhibited in **Figs. 9-10**. Frank further discloses that the beams are delayed so as not to interfere with each other as shown in **Fig. 4 and 5**. Frank clearly discloses chips as part of the base band system as exhibited **in Para 0029.**

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-11, 19-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoppenstein (US 2004/0204109 A1) in view of Frank et al. (US 2004/0127174 A1), hereinafter referenced as Hopp and Frank.

Consider **claim 1**, Hopp discloses a device for realizing beam-forming in CDMA system **(Abstract)**: said device comprising in a forward signal flow, at least a base band system **(Fig. 2 element 38, where Hopp discloses digital baseband)**, an optical transceiver system **(Fig. 4 elements 42 and 60, where Hopp discloses optical interfaces and Transceivers)**, a transceiver system **(Fig. 4 element 60)**, an analog fixed beam-forming network **(Fig. 4 element 22)**, a power amplifier **(Fig. 4 element 78 linear power amplifier)**, a transmission filter at a radio frequency front end **(Fig. 4 element 80, where Hopp discloses filters)**, and an antenna system **(Fig. 4 elements 34, 70)**; said device comprising in a reverse signal flow, at least the antenna system **(Fig. 4 elements 34, 70)**, a reception filter at a radio frequency front end **(Fig. 4**

element 70), a low noise amplifier**(Fig. 4 element 82)** , the analog fixed beam-forming network **(Fig. 4 element 22)**, the transceiver system **(Fig. 4 element 60)**, the optical transceiver system and the base band system **(Fig. 4 elements 42 and 60)**; the optical transceiver system comprising an optical fiber and an optical interface board close to the base band system and an optical interface board close to the transceiver system **(Fig. 2 element 42, where Hopp discloses optical interfaces)** and enabling the base band system be placed in a warehouse so as to make the base band system support more sectors, and a radio frequency part close to the antenna, thereby reducing power loss **(Col. 1: 55-60, where Hopp discloses the base band system at the base of the tower or other support structure)**; said optical interface board being used to interconvert electronic signals and optical signals input **(Figs. 2, and 4 element 42, optical interfaces, therefore interconverting electronic signals and optical signals input)**.

Hopp does not explicitly disclose that when transmitting forward signals, different beams are made to have different time delays in the base band system so that they are not coherent with one another even when different beams carry the same information. Frank discloses that when transmitting forward signals **(Para 0001, where Frank discloses a technique to reduce the amount of interference transmitted on forward link, therefore transmitting forward signals),** different beams are made to have different time delays in the base band system so that they are not coherent with one another even when different beams carry the same information **(Abstract, Para**

0006, 0029, Figs. 4, 5, where Frank discloses a plurality of offset circuits to offset the signals in time, therefore beams are made to have different time delays).

Therefore it would have been obvious to one of ordinary skills in the art at the time the invention was made to modify Hopp by specifically providing when transmitting forward signals, different beams are made to have different time delays in the base band system so that they are not coherent with one another even when different beams carry the same information, as taught by Frank, for the purpose of enhancing the capacity and coverage of the wireless system by enhancing the interference reduction as discussed in **Para 0004**.

Consider **claim 2**, the combination teaches everything claimed as implemented above (see claim 1). In addition, Hopp specifically discloses that wherein said base band system is composed of at least one base band chip or/and one base band logic **(Fig. 2)**.

Consider **claim 3**, the combination teaches everything claimed as implemented above (see claim 1). In addition, Hopp specifically discloses that wherein in a device composed of the analog fixed beam-forming network, when transmitting forward signals, in order to avoid mutual counteraction between multiple beams forming a common channel, after the signals pass through the optical fiber, different beams pass different transceiver systems, after passing their corresponding transceiver systems, the beams pass the analog fixed beam-forming network, and are amplified, filtered, and transmitted through antennas to former beams with different directions in space **(Figs. 4, 6A-B)**.

Hopp does not explicitly disclose that when transmitting forward signals, in order to avoid mutual counteraction between multiple beams forming a common channel, first, different beams are made to have different time delays in the base band system. Frank discloses that when transmitting forward signals, in order to avoid mutual counteraction between multiple beams forming a common channel, first, different beams are made to have different time delays in the base band system **(Abstract, Para 0006, Figs. 4, 5, where Frank discloses a plurality of offset circuits to offset the signals in time, therefore beams are made to have different time delays)**.

Consider **claim 4,** the combination teaches everything claimed as implemented above (see claim 1). In addition, Hopp specifically discloses that wherein said device composed of the analog fixed beam-forming network needs to correct the analog fixed beam-forming network, the power amplifier, the transmission and reception filter of radio frequency front end, the low noise amplifier, a feedback and the antenna system, and radio frequency cables there between **(Fig. 4)**.

Consider **claim 5,** the combination teaches everything claimed as implemented above (see claim 1). In addition, Frank specifically discloses that wherein said analog fixed beam-forming network may be Butler matrix, or Blass matrix, or electromagnetic lens of the Lunegberg or Rotman type **(Abstract, Para 0006, Fig. 4, where Frank discloses introducing Butler matrix to enhance the interference reduction)**.

Consider **claim 6,** the combination teaches everything claimed as implemented above (see claim 1). In addition, Hopp specifically discloses that wherein said device comprises the base band system, the optical transceiver system, the transceiver

system, an analog fixed beam-forming network formed by batter matrix, radio frequency cables between the transceivers and the analog fixed beam-forming network, radio frequency links including the power amplifier, the transmission filter and the reception filter of radio frequency front end, the low noise amplifier and a feedback line, and the antenna system; said optical transceiver system, transceiver system, analog fixed beam-forming network, antenna system and radio frequency links there between can be placed on a tower or a holding pole so as to make the radio frequency cables there between as short as possible and easy to correct, therefore loss generated on outputting power in the power amplifier is reduced, and an area covered is increased. Outputs of each sector of said base band system pass the transceiver system respectively, then pass the analog fixed beam-forming network, and, thereafter, reflect to fixed beams respectively; beams formed in said common channel is equivalent to beams added by the fixed beams **(Figs. 2, and 4)**.

Claim 7, as analyzed with respect to the limitations as discussed in claim 1.

Claim 8, as analyzed with respect to the limitations as discussed in claim 2.

Claim 9, as analyzed with respect to the limitations as discussed in claim 3.

Claim 10, as analyzed with respect to the limitations as discussed in claim 4.

Claim 11, as analyzed with respect to the limitations as discussed in claim 6.

Claim 19, as analyzed with respect to the limitations as discussed in claim 3.

Claim 20, as analyzed with respect to the limitations as discussed in claim 4.

Claim 21, as analyzed with respect to the limitations as discussed in claim 5.

Claim 22, as analyzed with respect to the limitations as discussed in claim 6.

Claim 23, as analyzed with respect to the limitations as discussed in claim 3.

Claim 24, as analyzed with respect to the limitations as discussed in claim 4.

Claim 25, as analyzed with respect to the limitations as discussed in claim 6.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 12-18, and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Frank.

Consider **claim 12**, Frank discloses a method for realizing beam-forming in CDMA system **(Para 0024, 0029, Figs. 4-5, where Frank discloses beam steering technique)**, at least comprising the following steps of: step one: in a base band, reflecting base band signals of each fixed beam to sectors of base band chips **(Fig. 4, where Frank discloses modifying signals by time delay circuitry)**; step two: making the base band signals of the fixed beams reflected to corresponding sectors of the base band chips have different time delays **(Abstract, Para 0025, 0029, Figs. 4-9, where Frank discloses modifying signals by time delay circuitry to offset the signals in time with respect to each other, and chips as part of the base band system,**

therefore signals of the fixed beams are reflected to corresponding sectors of the base band chips having different time delays).

Consider **claim 13,** the combination teaches everything claimed as implemented above (see claim 12). In addition, Frank specifically discloses that wherein, in said step one: the base band signals of each fixed beam is reflected to different sectors of the base band chips; or the base band signals of each fixed beam is reflected to same sectors of different base band chips **(Abstract, Para 0029, Figs. 4, 5)**.

Consider **claim 14,** the combination teaches everything claimed as implemented above (see claim 12). In addition, Frank specifically discloses that when transmitting in a traffic channel of a user, the transmitting can be made only within certain fixed beam where the user locates, that is, the base band signals of the fixed beams for this user are reflected to one certain corresponding sector of the base band chips, if the user locates among several beams, one or several narrow beams can be selected according to strengths of several user signals of beams received to transmit service data of the user, that is, the base band signals of the user is reflected to one or several corresponding sectors of the base band chips **(Figs. 3-9)**.

Consider **claim 15,** the combination teaches everything claimed as implemented above (see claim 12). In addition, Frank specifically discloses that wherein, in said step one: when transmitting in a common channel of each user, information of this channel should be transmitted in every fixed beam, that is, the information of the common channel is reflected to every sector of the base band chips **(Figs. 3-9)**.

Consider **claim 16,** the combination teaches everything claimed as implemented above (see claim 12). In addition, Frank specifically discloses that wherein, said step two: can be accomplished in the base band chips; or can also be accomplished by digital logic components after the base band chips, that is, accomplished in the base band **(Figs. 3-9)**.

Consider **claim 17,** the combination teaches everything claimed as implemented above (see claim 12). In addition, Frank specifically discloses that wherein, in said step two: a quantity of the time delay is such that output signals of each sector of the base band chips do not correlate with one another when transmitting common channel information **(Para 0025, Fig. 4)**.

Consider **claim 18,** the combination teaches everything claimed as implemented above (see claim 12). In addition, Frank specifically discloses that wherein: when transmitting common information, common channel beams do not correlate with one another when forming by making beams at an end of an antennas have different time delays, to avoid some area correlating with and counteracting one another when each fixed beam composing beams covering a whole sector **(Figs. 3-9)**.

Claim 26, as analyzed with respect to the limitations as discussed in claim 18.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BABAR SARWAR whose telephone number is (571)270-5584. The examiner can normally be reached on MONDAY TO FRIDAY 09:00 A.M -05:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NICK CORSARO can be reached on (571)272-7876. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BS/

/BABAR SARWAR/
Examiner, Art Unit 2617

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